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(54) Watering device for small animals

(57) A watering device (10) for fowl and small animals comprises a valve housing (12, 14) having an inlet (56) an outlet (18) and a valve chamber (24, 26, 42) between them. The valve chamber includes a valve element (74) and an actuator (68, 70) for the valve element extending out of the outlet (18). A flow restricting plunger (80) is located in the inlet. The plunger (80) preferably includes deformable retaining elements (84) to allow its insertion into but prevent its removal from the housing once inserted therein. As shown the lower end of the plunger (80) rests on the valve element (74) and its upper end extends above the inlet. The diameter of the plunger is preferably sufficiently less than that of the inlet passageway so as to permit continuous fluid flow to the valve element, but at the same time prevent larger particles of debris from passing into the valve housing. As the valve is actuated, the plunger slides vertically within and above the valve housing so as to prevent clogging of the fluid flow by the larger debris particles.

FIG. 1

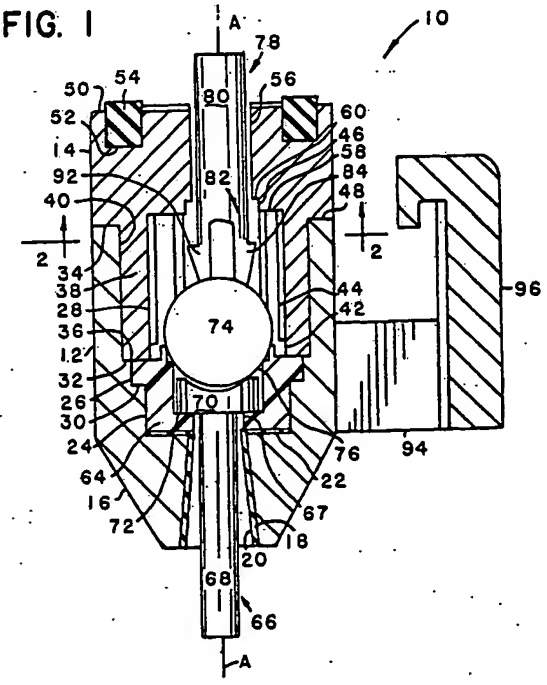

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FIG. 1

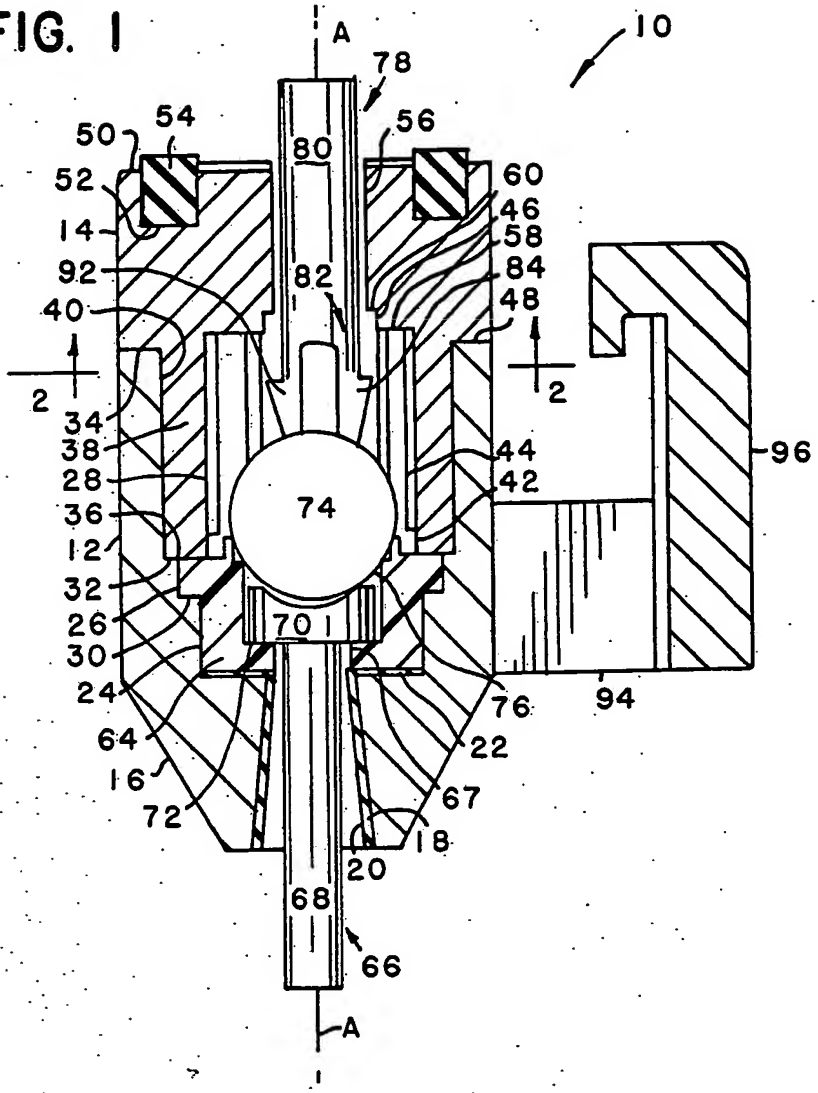
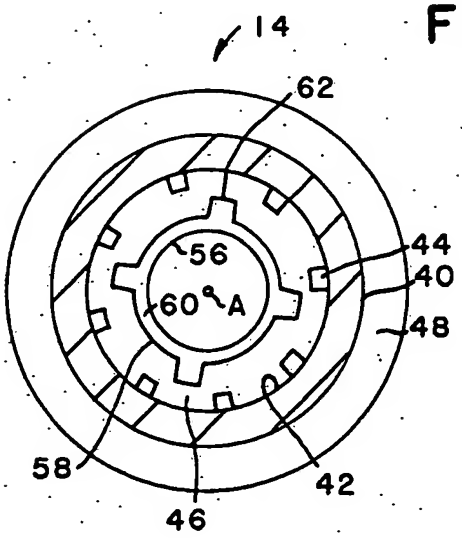


FIG. 2



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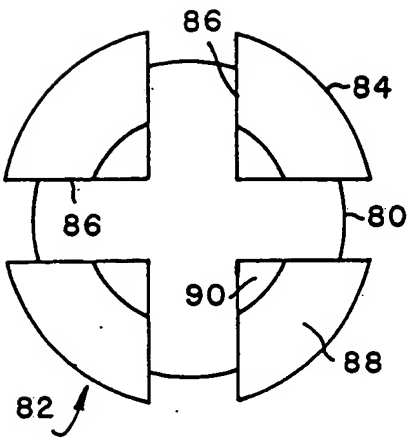

FIG. 3

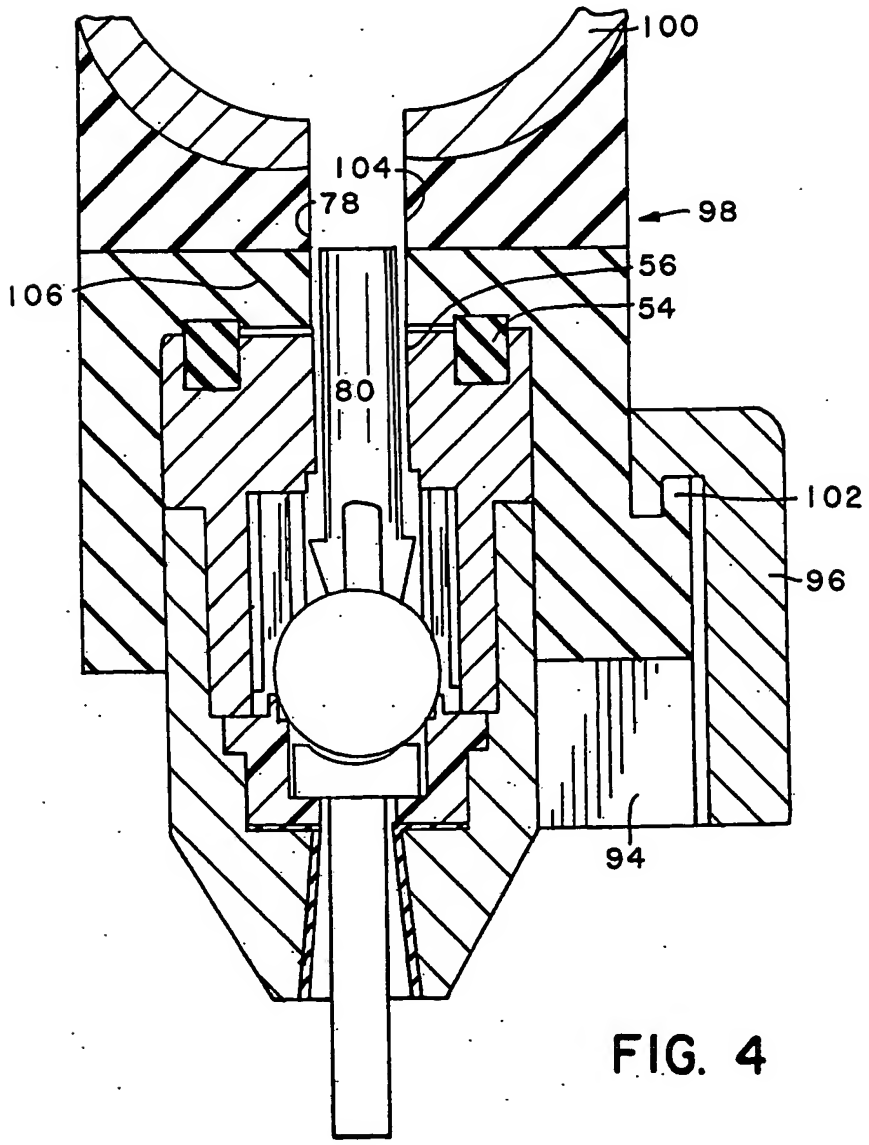

FIG. 4

WATERING DEVICE FOR SMALL ANIMALS

The present invention relates generally to watering devices for fowl and small animals, and more particularly to trigger drinkers for poultry.

Trigger drinkers are now well known and accepted in the poultry industry. One preferred type of trigger drinker is described in detail in United States Patents 4,589,373 and 4,637,345 in the name of the present applicants. The disclosures of those references are specifically incorporated herein. In generally, trigger drinkers can be mounted directly into a fluid supply line, typically via a retaining saddle connection. In an ordinary poultry house a plurality of supply lines are employed simultaneously, each with a large number of spaced-apart trigger drinkers attached thereto.

Modern trigger drinkers are distinguishable from earlier pin drinkers in that trigger drinkers are actuatable by motion from any direction whereas pin drinkers respond only to vertical motion. Furthermore, in the device of the above-mentioned patents, trigger drinker sensitivity (responsiveness to pecking) is further increased by the unique, leveraged actuation arrangement. In such trigger drinkers the amount of fluid provided upon each actuation is dependent upon the fluid pressure in the supply line and the size of the opening at the trigger pin outlet. Very rapid sequences of actuation are permitted, thus quickly providing the poultry with precisely metered increments of fluid in the amount actually desired. As a result, the fluid remains fresh and sanitary, leakage and excess fluid is avoided and every bird has a better

opportunity to obtain the necessary fluid.

Naturally, it is important that the trigger drinker assembly be durable and able to withstand years of nearly continuous usage without loss of precision or responsiveness. Over a period of time, in some circumstances, it may be possible that the frequent side-to-side motion of the trigger pin results in component wear which effectively enlarges the trigger pin outlet. Thus, actuation of the trigger drinker would provide a greater increment of fluid, sometimes in excess of the bird's capacity to use it immediately. Such excess fluid becomes spilled onto the bird or the floor and can lead to unsanitary conditions, including wet manure pits, and increase the mortality rate of the birds.

Component wear problems of this type are especially likely where a metal liner is not disposed about the trigger pin below the valve seat. Since trigger pins are typically constructed of stainless steel and the housing is moulded from a plastics material, without such a metal liner the housing could be quickly worn away at the trigger pin outlet. It is sometimes possible to compensate for the outlet enlargement by reducing fluid pressure in the supply line. However, even this temporary solution is not available where reliable, low pressure regulators are not employed.

Another problem facing poultry watering devices arises where the fluid supply is not sufficiently filtered and debris, dirt, rust and other small particles are carried through the supply line. Trigger drinkers of the type described in the above-mentioned patents employ a self-cleaning ball valve arrangement

which prevents many of the smaller particles from causing valve leakage or deterioration. However, larger particles can sometimes clog the flow passages leading to the ball valves. Static filter screens have been employed in efforts to prevent this clogging, but such screens are relatively expensive to install and still typically require periodic cleaning.

Several prior patents disclose poultry watering devices having valve arrangements which seek to avoid clogging by using movable valve elements. However, such constructions typically employ a spaced-apart set of valves which define a metering cavity between them. For example, when the lower valve is opened to drain the fluid, the upper valve shuts off flow from the supply line. When the lower valve is released, the upper valve opens and permits the metering cavity to be refilled. However, if actuated in rapid succession, the cavity may not have time to refill completely. Thus, either precision or sensitivity is precluded.

Other constructions permit a continuous flow of fluid of the valve arrangement, but employ a weighted plunger upstream from and supported on the valve. While that may help to ensure positive sealing of the valve, it also makes actuation more difficult, especially for day-old chicks.

Finally, even where anti-clogging plungers are employed upstream from the valve and do not significantly interfere with valve actuation, those plungers are uniquely configured for inclusion in a specific, pre-assembled drinker. Such plungers cannot be readily retrofitted in the field to existing drinkers.

Accordingly, it is an object of the present

invention to provide an improved trigger drinker for fowl and small animals, having increased durability and precision.

A further object is to provide an inexpensive mechanism which can be readily applied to existing drinkers to increase durability, prevent clogging and improve precision.

Another object is the provision of an improved, self-cleaning arrangement for trigger drinkers in which actuation sensitivity is not significantly decreased.

Yet another object is to provide an anti-clogging arrangement for trigger drinkers which is wear resistant and permits continuous fluid flow from the supply line to the valve assembly.

According to one aspect of the present invention, there is provided a watering device for fowl and small animals which comprises: a valve housing having an inlet, an outlet, and a valve chamber therebetween; the valve chamber including a valve member therein for controlling fluid flow to the outlet; means for actuating the valve member extending from the valve member and outwards from the outlet; and, means for restricting fluid flow through the inlet, adapted to be inserted through the inlet and into the valve chamber.

Preferably, the restriction means includes means for preventing its removal from the valve chamber once inserted, and is further adapted to permit a continuous flow of fluid to the valve member. Preferably, the inlet includes an inlet port and a passageway of predetermined length extending from the inlet port to the valve chamber and the restriction means extends at least the length of the passageway and is adapted to be movable.

Preferably, the inlet includes a cylindrical bore of uniform diameter through the valve housing to the valve chamber, the valve chamber is dimensioned so as to have a diameter larger than the bore, and the restriction means includes a cylindrical stem portion of smaller diameter than the bore so as to permit fluid flow through the inlet and the bore between the valve housing and the stem portion.

Preferably, one end of the stem portion has an enlarged portion which normally has a radial dimension larger than the diameter of the bore, the enlarged portion being compressible so as to permit its insertion into the inlet, through the bore, and into the valve chamber, the enlarged portion being expandable with the valve chamber to a radial dimension larger than the diameter of the bore without preventing fluid flow to the valve chamber through the bore. The stem portion may extend along a longitudinal axis and the enlarged portion may include at least one projection from the step portion generally extending along the longitudinal axis and including an inclined end face tapered radially outwards and rearwards. The stem portion may extend along a longitudinal axis and the enlarged portion may include a plurality of spaced-apart projections from the stem portion generally extending along the longitudinal axis, the projections each being flexible towards each other and having an inclined end face tapered radially outwards and rearwards.

Preferably, the enlarged portion includes a radially extending rear wall and the valve housing includes an edge at the junction of the bore and the valve chamber for retaining the said rear wall and for

preventing removal of the enlarged portion from the valve chamber. Preferably, the valve member is engageable with the enlarged portion upon actuation of the valve member to cause movement of the stem within the bore. Preferably, the stem is longitudinally dimensioned such that, when the enlarged portion is inserted within the valve chamber, a portion of the stem extends outwards upstream from the inlet. Preferably, the stem portion includes an upstream extension from the inlet when the enlarged portion is disposed within the valve chamber so that when the stem portion slides vertically, the upstream extension prevents clogging and blockage of the inlet.

Preferably, the device includes a valve seat located in the valve chamber upstream from the outlet, on which the valve member normally bears.

The objects of the present invention may therefore be attained by the provision of a flow-restricting plunger which is insertable into the inlet passageway of a fully assembled valve housing of a trigger drinker. The plunger preferably includes retaining elements to prevent its removal from the housing once inserted therein. The lower end of the plunger may rest on the valve element and its upper end may extend above the inlet. The diameter of the plunger is preferably sufficiently less than that of the inlet passageway to permit continuous fluid flow to the valve element, but at the same time the plunger may prevent larger particles of debris from passing into the valve housing. As the valve is actuated, the plunger slides vertically within and above the valve housing so as to prevent clogging of the fluid flow by the larger debris particles.

The end of the plunger resting on the valve element is preferably enlarged and includes peripheral channels extending towards the inlet which prevent an extreme valve actuation force from blocking fluid flow. At the same time, these channels aid in permitting resilient deformation of that end of the plunger as it is inserted through the inlet towards the valve chamber. Once within the valve chamber, the plunger expands to its normal dimensions and this prevents its removal through the inlet.

According to another aspect of the invention, there is provided a method of assembling a watering device for fowl and small animals, which includes a valve having an inlet, an outlet and a valve chamber therebetween, valve means for controlling fluid flow through the outlet, means for actuating the valve means and means for restricting continuous fluid flow through the inlet which is adapted to be inserted through the inlet and includes means for preventing its removal from the inlet, the method comprising: firstly, assembling the valve housing with the valve means disposed within the valve chamber and the means for actuating the valve means disposed within the outlet; and secondly, inserting the means for restricting the continuous fluid flow into the inlet so that the means for preventing its removal is operable.

The method may include the further step of connecting the valve housing to a fluid supply line so that fluid flow is permitted to the inlet with the means for restricting continuous fluid flow defining the fluid path to the valve chamber.

Preferably, the first step of assembling the valve housing includes initially disposing the valve means

and the means for actuating the valve means in at least one of a plurality of interfitting components and then connecting the remainder of the interfitting components together so as to form the complete valve housing. Preferably, where the valve housing has a first interfitting component with the inlet formed therein and a second interfitting component with the outlet formed therein, the first and second components together forming the valve chamber when connected together, and the valve means including a valve element and a valve seat, the initial disposition of the first step includes first locating the valve seat in the second component, and then locating the means for actuating the valve means within the outlet, and then locating the valve element in the second component. Preferably, the method includes the further step of inserting the valve housing into a connection saddle attached to a fluid supply line and then securing the valve housing thereto.

According to another aspect of the invention, there is provided a fluid flow restrictor for insertion through a valve housing inlet bore and into a valve chamber of a watering device for fowl and small animals, comprising: an elongate stem portion having a smaller cross-sectional dimension than that of the inlet bore so that continuous fluid flow is permitted through the bore to the valve chamber between the stem and the valve housing; an enlarged portion connected to the stem normally having larger cross-sectional dimension than that of the inlet bore; the enlarged portion being deformable so as to permit its insertion through the bore and into the valve chamber; the enlarged portion being expandable once within the valve

chamber to have a cross-sectional dimension larger than that of of the inlet bore; and the enlarged portion including means for preventing the removal of the stem portion from the bore when the enlarged portion is within the valve chamber.

Preferably, the valve chamber includes a movable valve member and the enlarged portion is normally in contact with the valve member when disposed within the valve chamber. Preferably, the stem portion is actuatable by movement of the valve member to slide within the bore. Preferably, the stem portion extends along a longitudinal axis and normally projects out of the valve housing beyond the inlet bore when the enlarged portion is within the valve chamber.

Preferably, the enlarged portion includes peripheral fluid channels to the stem portion. Preferably, the stem portion is generally cylindrical and the enlarged portion includes a plurality of spaced-apart projections, each of which has an inclined end face. Preferably, each projection extends generally parallel to the longitudinal axis of the stem portion and is formed to deflect resiliently radially inwards upon insertion of the inclined end faces into the inlet bore.

The invention may be carried into practice in various ways and one embodiment will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a partial vertical cross-section along the longitudinal axis A of a trigger drinker embodying the present invention;

Figure 2 is a cross-section of the cap member taken along the line 2-2 of Figure 1;

Figure 3 is an enlarged end view of the lower end of the restriction plunger of the trigger drinker of Figure 1; and

Figure 4 is a view similar to Figure 1 showing the trigger drinker in connection with a retaining saddle at a fluid supply line.

Figure 1, which illustrates a preferred embodiment of the present invention, shows a trigger drinker 10 having a base member 12 and a cap member 14. The base 12 is generally tubular with a tapered portion 16 at one end. The cap 14 is also generally tubular and is dimensioned so as to fit into the base 12 telescopically along the longitudinal axis A, as described below. Both the base 12 and the cap 14 are preferably moulded from a plastics material.

As will be readily understood from the above-mentioned earlier US patents, the base member 12 includes a lower bore 18 which is, for example, conically tapered so as to have its largest diameter at the lowermost portion of the base 12. A liner 20 having a corresponding taper is disposed within the bore 18. In certain preferred embodiments, the conical tapers of the bore 18 and liner 20 terminate in cylindrical portions at the uppermost portions of those elements. The liner 20 is supported in that base 12 on a radially extending shoulder 22 thereby preventing axial movement through the bore 18. The liner 20 is, for example, formed from metal and is a press fit into the base 12. Alternatively, the liner 20 can be secured in place during moulding of the base 12.

The base 12 further includes a bore 24, a bore 26 and a bore 28, extending progressively axially upwards from the shoulder 22. Shoulders 30 and 32 extend

radially outwards progressively further than the shoulder 22 and separate the bores 24 and 26 and the bores 26 and 28, respectively. The base 12 also includes an end face 34 as its uppermost flat surface.

The cap 14 is formed with a lowermost end face 36 on a tubular portion 38. This portion includes an exterior surface 40 and an interior bore 42. the exterior surface 40 terminates at a radially extending shoulder 48. In especially preferred embodiments, a plurality of guide ribs 44 are disposed about the circumference of the bore 42. The guide ribs 44 preferably extend axially from an end face 46 for less than the entire length of the bore 42.

The upper surface 50 of the cap 14 includes an O-ring seat 52 which holds a resilient O-ring seal 54. An inlet passageway 56 extends axially downwards from the upper surface 50 towards the end face 46. This inlet passageway is preferably an elongate bore along the axis A or a cylindrical opening of uniform diameter, except in the area immediately adjacent the end face 56. At that location, an intermediate bore 58 separates the enlarged bore 42 and the passageway 56. The intermediate bore 58 borders the passageway 56 along a radially extending step 60. As shown in Figure 2, a plurality of inclined slots 62 are formed between the step 60 and the end face 46.

A triple valve seat element 64 is located within the base member 12 and is supported on the shoulders 22 and 30. The seat element 64 includes a lower bore 67 which is aligned with the bore 18 and the opening through the liner 20 when the seal element 64 is supported in the base member 12. Typically, the diameter of the bore 67 corresponds with the diameter

of the uppermost opening through the liner 20.

An actuator 66, including a pin 68 and a head 70 is mounted within the base 12 with the head portion 70 normally supported on the lower seat 72 of the seat element 64 and the pin 68 extending through the bore 67 and the outlet opening of the liner 20. A ball valve 74 is normally seated on an upper double seat 76 of the seat element 64. The diameter of the ball valve 74 is just less than the spacing between opposing guide ribs 44. The lowermost portion of the ball valve 74 is adjacent and operably associated with the upper surface of the head portion 70.

As described in the above mentioned prior art references, movement of the pin 68 in any direction causes valve actuation by leverage lifting of the ball calve 74 off the double seat 76. Fluid flow is thereby permitted from the inlet passageway 56, past the ball valve 74 and the head portion 70, and through the outlet bore 18. In previous trigger pins of this type, the amount of fluid provided upon each actuation of the pin 68 depended upon the pressure of the fluid in the supply line to the inlet passageway and upon the size of the opening between the pin 68 and the uppermost portion of the liner 20 and/or bore 67.

The trigger drinker 10 is preferably assembled by locating the seat element 64 in the base 12 through the upper opening of the bore 28. Thereafter, the actuator 66 is inserted through the bore 28 and the bore 67 to rest on the seat 72 with the pin 68 extending below the base 12. Next, the ball valve 74 is inserted through the bore 28 to rest on the double seat 76. With the valve member thus in place within the base 12, the cap 14 is telescopically slid into place. The exterior

surface 40 forms a close interference fit within the bore 28 which prevents fluid leakage. The shoulder 48 is similarly joined to the end face 34. The end face 36 rests on the shoulder 32 and the upper surface of the seat element 64. The end face 36 thus prevents the seat element 64 from moving axially upwards along the axis A.

In especially preferred embodiments where, for example, the seat element 64 is formed from a resilient or elastic material, the end face 36 forms an additional fluid seal with that upper surface of the seat element 64 so as to prevent fluid leakage to the exterior of the valve housing.

With the base 12 and cap 14 thus assembled, a valve chamber is formed within the bores 24, 26 and 42. The valve member,formed by the ball valve 74 the seat element 64 and the head 70, is located within this valve chamber. The actuator 66 extends from the valve chamber through the fluid outlet where it is accessible for actuating contact.

The improvement of the present invention includes a restriction plunger 78 which extends through the inlet passageway 56 to the valve chamber. The restriction plunger 78 includes a cylindrical stem portion 80 having a slightly smaller diameter than the diameter of the inlet passageway 56 and extend upwards from the surface 50 in the direction of fluid flow from the supply line. The restriction plunger 78 also includes an enlarged portion 82 at its lower end. Normally, the cross-sectional dimensions of the enlarged portion 82 are larger than the diameter of the inlet bore 56. However, the enlarged portion 82 is formed so as to be radially deformable or compressible

so that the enlarged portion may be inserted into and through the inlet bore 56 towards the valve chamber. Upon insertion into the valve chamber, the enlarged portion 82 expands radially to resume its normal configuration, that configuration typically having a smaller dimension than the diameter of the valve chamber.

To enable such resilient deformation, the enlarged portion 82 includes a plurality of projections 84 extending axially from the lower portion of the stem 80. As shown most clearly in Figure 3, the projections 84 are spaced apart by axially extending channels 86. Each projection 84 includes an inclined end portion or conically tapered segmental end 88 which tapers radially outwards and rearwards up the axis A, and a substantially flat end face 90.

The restriction plunger 78 is preferably constructed from a lightweight, resilient material, such as nylon or some other plastics material. The dimensions of the channels 86 and the projections 84 are further selected so that the end portions of these projections may be resiliently compressed together towards the axis A or into the channels, thereby reducing the cross-sectional dimension so that insertion through the passageway 56 is permissible. The inclined or conical end faces 88 facilitate this compression by camming the projections 84 towards each other at the initial entrance to the passageway 56. The flattened end faces 90 allow the restriction plunger 78 to be supported on the ball valve 74 without significantly interfering with the ball valve actuation.

The restriction plunger 78 is preferably inserted

into the inlet passageway 56 subsequent to the assembly of the valve housing structure by the base 12 and cap 14. Once inserted within the valve housing so that the enlarged portion 84 is inside the valve chamber, rearward teeth or walls 92 prevent the restriction plunger 78 from being removed through the inlet passageway 56 from the valve chamber. These teeth are adapted to engage the end face 46 upon upward movement of the plunger. In especially preferred embodiments, the teeth 92 will engage the shoulder 60, thus allowing part of the enlarged portion 84 to be partially withdrawn from the valve chamber to avoid any interference with actuation of the ball valve. When the teeth 92 are in engagement with the shoulder 60 or the end face 46 to prevent removal of the restriction plunger 78, the channels 86 and 62 ensure that fluid flow from the inlet to the valve member will not be interrupted. At the same time, these channels serve to prevent extreme upward motion of the ball valve 74 from blocking fluid flow.

In the arrangement of Figure 1, actuation of the pin 68 will cause the valve member to become unseated and, since the end face 90 is supported on the ball valve 74, the restriction plunger 78 will be displaced within the inlet passageway 56. Since this displacement is substantially vertical and the inlet passageway 56 and the stem portion 80 preferably have the same diameters, minimal wear will result between these two elements despite long periods of continuous actuation of the valve member and sliding of the restriction plunger. Thus, the stem portion serves to precisely meter the fluid flow for each instance of actuation for a given fluid pressure in the supply

line. Furthermore, where the dimensional difference between the diameter of the stem 80 and the bore 56 is relatively small, such as 0.001 inches (0.025mm), the restriction plunger serves to prevent larger particles of debris from entering the valve chamber and/or clogging the inlet flow passage. In addition, the frequent up-and-down motion of the plunger within the valve step advantageously functions as a self-cleaning mechanism to displace any debris adjacent the inlet and ensure continuous flow of fluid to the valve member. As a result, there is no time delay required between triggering actuation to ensure proper fluid metering.

As shown in Figure 4, after insertion of the restriction plunger 78 into the inlet passageway 56, the valve housing 1 is connected to a retaining saddle 98 mounted on a fluid supply line 100. A lateral arm 94 and an engagement hook 96 are provided for securing the valve housing 10 to the saddle 98 via a mating engagement hook 102. When the trigger drinker is secured in the saddle 98, the inlet passageway 56 is aligned with the bore 104 leading from the supply line 100. The O-ring seal 54 provides a fluid tight seal about that passageway connection against an end wall 106. The stem 80 of the restriction plunger 78 preferably extends with small clearance into the bore 104 and can, in certain applications, extend into the supply line 100.

Although the present invention has been described in detail other variants are possible. For example, the present invention may be applied where trigger drinkers are indirectly actuated, as in co-pending United States Application No.821,072, filed January 21, 1986.

CLAIMS

1. A watering device for fowl and small animals which comprises: a valve housing having an inlet, an outlet, and a valve chamber therebetween; the valve chamber including a valve member therein for controlling fluid flow to the outlet; means for actuating the valve member extending from the valve member and outwards from the outlet; and, means for restricting fluid flow through the inlet, adapted to be inserted through the inlet and into the valve chamber.

2. A device as claimed in Claim 1 in which the restriction means includes means for preventing its removal from the valve chamber once inserted.

3. A device as claimed in Claim 1 or Claim 2 in which the means for restricting fluid flow is further adapted to permit a continuous flow of fluid to the valve member.

4. A device as claimed in any preceding Claim in which the inlet includes an inlet portion and a passageway of predetermined length extending from the inlet port to the valve chamber and the restriction means extends at least the length of the passageway and is adapted to be movable.

5. A device as claimed in any of Claims 1 to 3 in which the inlet includes a cylindrical bore of uniform diameter through the valve housing to the valve chamber, the valve chamber is dimensioned so as to have a diameter larger than the bore, and the restriction

means includes a cylindrical stem portion of smaller diameter than the bore so as to permit fluid flow through the inlet and the bore between the valve housing and the stem portion.

6. A device as claimed in Claim 5 in which one end of the stem portion has an enlarged portion which normally has a radial dimension larger than the diameter of the bore, the enlarged portion being compressible so as to permit its insertion into the inlet, through the bore, and into the valve chamber, the enlarged portion being expandable with the valve chamber to a radial dimension larger than the diameter of the bore without preventing fluid flow to the valve chamber through the bore.

7. A device as claimed in Claim 6 in which the stem portion extends along a longitudinal axis and the enlarged portion includes at least one projection from the step portion generally extending along the longitudinal axis and including an inclined end face tapered radially outwards and rearwards.

8. A device as claimed in Claim 6 in which the stem portion extends along a longitudinal axis and the enlarged portion includes a plurality of spaced-apart projections from the stem portion generally extending along the longitudinal axis, the projections each being flexible towards each other and having an inclined end face tapered radially outwards and rearwards.

9. A device as claimed in Claim 8 in which the enlarged portion includes a radially extending rear

wall and the valve housing includes an edge at the junction of the bore and the valve chamber for retaining the said rear wall and for preventing removal of the enlarged portion from the valve chamber.

10. A device as claimed in any of Claims 6 to 9 in which the valve member is engageable with the enlarged portion upon actuation of the valve member to cause movement of the stem within the bore.

11. A device as claimed in Claim 10 in which the stem is longitudinally dimensioned such that, when the enlarged portion is inserted within the valve chamber, a portion of the stem extends outwards upstream from the inlet.

12. A device as claimed in Claim 11 in which the stem portion includes an upstream extension from the inlet when the enlarged portion is disposed within the valve chamber so that when the stem portion slides vertically, the upstream extension prevents clogging and blockage of the inlet.

13. A device as claimed in any preceding claim including a valve seat located in the valve chamber upstream from the outlet, on which the valve member normally bears.

14. A watering device for fowl and small animals constructed and arranged substantially as herein specifically described with reference to and as shown in the accompanying drawings.

15. A method of assembling a watering device for fowl and small animals, which includes a valve having an inlet, an outlet and a valve chamber therebetween, valve means for controlling fluid flow through the outlet, means for actuating the valve means and means for restricting continuous fluid flow through the inlet which is adapted to be inserted through the inlet and includes means for preventing its removal from the inlet, the method comprising: firstly, assembling the valve housing with the valve means disposed within the valve chamber and the means for actuating the valve means disposed within the outlet; and secondly, inserting the means for restricting the continuous fluid flow into the inlet so that the means for preventing its removal is operable.

16. A method as claimed in Claim 15 further comprising the step of connecting the valve housing to a fluid supply line so that fluid flow is permitted to the inlet with the means for restricting continuous fluid flow defining the fluid path to the valve chamber.

17. A method as claimed in Claim 15 or Claim 16 in which the first step of assembling the valve housing includes initially disposing the valve means and the means for actuating the valve means in at least one of a plurality of interfitting components and then connecting the remainder of the interfitting components together so as to form the complete valve housing.

18. A method as claimed in Claim 17 the valve housing having a first interfitting component with the

inlet formed therein and a second interfitting component with the outlet formed therein, the first and second components together forming the valve chamber when connected together, and the valve means including a valve element and a valve seat, in which method the initial disposition of the first step includes first locating the valve seat in the second component, and then locating the means for actuating the valve means within the outlet, and then locating the valve element in the second component.

19. A method as claimed in Claim 18 further comprising the step of inserting the valve housing into a connection saddle attached to a fluid supply line and then securing the valve housing thereto.

20. A fluid flow restrictor for insertion through a valve housing inlet bore and into a valve chamber of a watering device for fowl and small animals, comprising: an elongate stem portion having a smaller cross-sectional dimension than that of the inlet bore so that continuous fluid flow is permitted through the bore to the valve chamber between the stem and the valve housing; an enlarged portion connected to the stem normally having larger cross-sectional dimension than that of the inlet bore; the enlarged portion being deformable so as to permit its insertion through the bore and into the valve chamber; the enlarged portion being expandable once within the valve chamber to have a cross-sectional dimension larger than that of of the inlet bore; and the enlarged portion including means for preventing the removal of the stem portion from the bore when the enlarged portion is within the valve

chamber.

21. A fluid flow restrictor as claimed in Claim 20 in which the valve chamber includes a movable valve member and the enlarged portion is normally in contact with the valve member when disposed within the valve chamber.

22. A fluid flow restrictor as claimed in Claim 21 in which the stem portion is actuatable by movement of the valve member to slide within the bore.

23. A fluid flow restrictor as claimed in any of Claims 20 to 22 in which the stem portion extends along a longitudinal axis and normally projects out of the valve housing beyond the inlet bore when the enlarged portion is within the valve chamber.

24. A fluid flow restrictor as claimed in any of Claims 20 to 23 in which the enlarged portion includes peripheral fluid channels to the stem portion.

25. A fluid flow restrictor as claimed in any of Claims 20 to 24 in which the stem portion is generally cylindrical and the enlarged portion includes a plurality of spaced-apart projections, each of which has an inclined end face.

26. A fluid flow restrictor as claimed in Claim 25 in which each projection extends generally parallel to the longitudinal axis of the stem portion and is formed to deflect resiliently radially inwards upon insertion of the inclined end faces into the inlet bore.

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